PROCEEDINGS

OF THE

PACIFIC COAST ENTOMOLOGICAL SOCIETY

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NINETIETH MEETING

The ninetieth meeting of the Society was held on Saturday evening, August 25, 1923, in the Board room of the Mechanics' Institute.

In the absence of both the president and vice-president, Mr. Van Duzee was called upon to preside as president *pro tempore*.

Minutes of the preceding meeting were read and approved.

The following eleven members were present: E. P. Van Duzee, F. E. Blaisdell Sr., H. E. Burke, V. M. Tanner, R. D. Hartman, J. O. Martin, Dr. W. D. Pierce, Miss Helen Sanford, Dr. E. H. Nast, Mrs. F. E. Blaisdell, and Charles L. Fox.

Guest of the evening: Mrs. V. M. Tanner.

After reading of the treasurer's report, Dr. Blaisdell stated that Mr. Van Duzee had handed him the names of two persons who wished to become members of the Society, namely: Dr. E. H. Nast and Dr. John Comstock of Los Angeles. The proposals being seconded by Dr. Blaisdell and Mr. Fox, they were unanimously elected to membership in the Society.

Mr. Van Duzee then referred to the meeting of the Affiliated Societies in Los Angeles on September 17, 1923, stating that he would be in attendance and hoped that other members would be able to be present also.

Dr. Pierce, consulting biologist of San Mateo (since moved to Banning, California), being called upon spoke of the problems of the consulting entomologist. At San Mateo the two dominant problems are the control of the Argentine ant and the control of snails and slugs. Dr. Pierce spoke briefly of his methods in each of these problems. He also told of the great variety of questions that come in, such as the saving of the strawberry fields from destruction by the red spider, for which no satisfactory means is yet known; advise as to sow bugs, grasshoppers, and mealybug control; goathead bots; bulb diseases; root nematodes; uses for chemicals and by-products; technical advertising, etc.

Dr. Pierce exhibited several slugs, *Ariolimax columbianus* and *Ariolimax californicus*, mummified by his control chemicals.

Dr. Burke was next called upon and told of the results of a trip made by himself and Mr. Hartman to Chico and vicinity on June 12-13. A colony of the lately described *Buprestis viridisuturalis* N. and W. was found in Bidwell Park, Chico, in the trunk of a fallen native cottonwood. Small to large larvæ were

found in mines in the outer wood, and prepupal larvæ, pupæ and recently transformed young adults in pupal cells just beneath the surface of the wood. A number of the pupal cells contained full-grown *Oryssus* larvæ with the remains of the *Buprestis* larvæ. Evidently the *Oryssus* destroys a large percentage of the *Buprestis* brood.

In the mountains near Stirling City a colony of *Buprestis langii* Mann. was found in a down, weather-beaten, Douglas spruce log. Small to large larvæ, pupæ, and recently transformed young beetles were found in the wood. The larval mines were in the outer heartwood, and the pupal cells about two inches beneath the surface. Before pupating, the larva mines close to the surface and retreats about two inches before forming the pupal cell, which is closed off from the end of the mine by a plug of borings. One *Buprestis rusticorum* Kby. pupa was found in the colony of *Buprestis langii*. Several larvæ and one dead beetle of *Buprestis aurulenta* L. were found in the wood of a pitchy strip in one side of the stump of the log.

Near Magalia a large colony of *Buprestis gibbsii* Lec. was found in the wood of a California black oak. One side of the trunk and the top of the tree was dead; the other side of the trunk was alive and it bore a large live branch. The *gibbsii* were working in the solid wood of the dead side. Some larvæ, a few pupæ, and numerous recently transformed adults were found. The smaller larvæ were in mines in the heartwood, while the prepupal larvæ, pupæ, and beetles were in pupal cells about three inches beneath the surface of the wood. Before pupating, the larva mines close to the surface of the wood. It then retreats about three inches and forms the pupal cell, closing it off from the end of the mine by a plug of borings. Numerous *Oryssus* larvæ were found in the cells of the *Buprestis* with the remains of the *Buprestis* larvæ. In one case the *Oryssus* larva had just attacked the *Buprestis* larva and was feeding upon it, at the junction of the abdomen and the thorax.

Most of the pupæ of the three species, *Buprestis gibbsii, viridisuturalis* and *langii* transformed, producing a number of beetles. These were paired and placed in rearing-jars. *Langii* and *viridisuturalis* were given willow leaves for food, and *gibbsii* live oak leaves. All of the species fed considerably on the leaves given them. Practically always, feeding commenced on the edge of the leaf and followed in toward the midrib until large notches were eaten out. Sometimes most of the leaf was eaten, but usually the beetles would go from one leaf to another without eating the larger part of any one leaf.

The beetles lived in the rearing-jars from two to four weeks. Some of the pairs of all of the species mated, but no eggs were obtained except from *gibbsii*. These are whitish opaque, oblong oval, rather pointed at both ends, 1½ mm. long, ¾ mm. in diameter. As they are laid together in groups, they lose their

general form, taking the form of the crevice into which they are pressed. A few of the eggs were laid in the old mines of ambrosia beetles in a section of wood from the same tree from which the beetles emerged. Most of them, however, were laid between the sections of wood and the paper bottom which formed the cage. As many as eighty eggs were laid in a single group. They were firmly glued to each other and to the wood and paper with which they came in contact. One female laid as many as 172 eggs. A female would lay a group of eggs, feed a day or so, and lay some more eggs. The same pair copulated a number of times.

All the eggs appeared to be fertile. A number of them were destroyed by a predaceous mite, *Pediculoides,* but a number hatched at the end of thirty days. The first hatching took place August 14, from eggs laid July 14, and the last hatching September 8-11 from eggs laid August 7-8.

The first stage larva is very interesting. It has paired, forked, chitinous tail processes like the larva of *Agrilus* which is quite different from the older larval stages of the *Buprestis.* Although it is without legs, it is able to travel quite rapidly on its side by undulating its body up and down. It can move up a steep surface and even over the edge of a section of paper toweling and along the lower surface. Apparently, it is able to do this with the aid of tufts of long hairs which project from the sides of the segments.

Mr. Tanner of the Dixie Normal School, St. George, Utah, then told of his work and of his special studies in the Cicindelidæ. He had taken twenty-three species of the genus and had extended the range of several species of insects.

Mr. Hartman responded to an invitation to tell of his work, and did so as follows: "Several weeks ago our laboratory was requested to investigate the cause of a serious defoliation upon several areas of Monterey pine in the Del Monte Forest Company's properties near Pacific Grove. Upon examination, the trouble was found to be caused by a saw-fly, *Itycorsica brunnicans* Nort., the larvæ of which had completely defoliated many young, as well as old, trees. At the time of examination a number of adults were observed flying. The eggs are canoe-shaped and deposited singly near the tip of the needles. The larva, upon hatching, feeds on the foliage by severing the needles about one-third from their base. Portions of these severed needles are also used to construct a small silken tube, within which the larva shelters itself. Experiments are now being carried on for the control of this species.

"Regarding the live oaks: The present indications are that the cynipid oak-leaf gall *Callirhytis bicornis* Mc. C. and Egbert will be very common again this coming fall and winter in the Santa Clara Valley. Although adults were observed ovipositing in the underveins of the leaves of *Quercus agrifolia* during March, the

gall swellings are just now discernible with the aid of the binocular. Within the next few weeks it is expected that some of the galls will have reached maturity. His observations indicate that this species has an alternate generation in the form of pistol-shaped galls in the staminate flowers. During the fall of 1921 considerable premature defoliation was caused by the leaf-infesting generation in the Santa Clara Valley. They also had one complaint from Alhambra."

Mr. Fox reported his trip to the Sequoia National Park and exhibited a box of ichneumons.

Dr. Nast stated that he was preparing to study the aquatic insects.

Miss Sanford was next called upon and told of her visit to the Yellow Stone National Park.

Mr. Martin reported his trip into Lassen and Plumas County, to an elevation of 6500 feet, and to the headwaters of the Feather River, and the unusual cold weather encountered, with snow storms in July. Beginning July 10, he visited a series of lakes.

Dr. Blaisdell then told of a vacation tour through southern California, having done very little collecting, except in the vicinity of Ventura and Santa Paula, Ventura County. Near the former town, on Rincon beach, he took *Catorama latum* from dried kelp at the upper limit of the beach, and a good series of *Coelus* in the same locality. He also stated that his attention had recently been drawn to *Euryopthalmus californicus* Van D. injuring the fruit of the mulberry by sucking the juice. He saw an infested tree on which there were at least six or eight of these bugs to a berry. This observation was made on Dr. Josef Novitzky's place at Thousand Oaks, Berkeley, California. Later, and from an entirely different source, his attention was again called to the same species on fruit. Mr. Van Duzee stated that these facts were known, as a species in Texas was similarly injurious.

After considerable discussion, the meeting adjourned.

F. E. Blaisdell, Secretary.

The ninety-first meeting of the Society was held in Room 302, Administration building, University of Southern California, Los Angeles, California, on Monday morning, September 17, 1923, in connection with meetings of the Pacific Division of the American Association for the Advancement of Science.

Upon motion of Mr. E. P. Van Duzee, seconded by R. E. Campbell, Dr. J. A. Comstock was elected chairman for the meeting, and H. E. Burke, secretary.

The following members and guests were present: A. J. Basinger, H. E. Burke, R. E. Campbell, J. A. Comstock, F. R. Cole, H. S. Fawcett, C. K. Fisher, R. D. Hartman, Trevor Kincaid, A. O. Larsen, Isabel McCracken, H. S. Smith, H. E. Summers, Mr. Osterhout, E. P. Van Duzee, Mr. and Mrs. W. H. Volck, Mr. and Mrs. W. S. Wright.

The following program was then proceeded with:

Paper by Mr. W. S. Wright, Problems of the Amateur Entomologist.

Discussion by Comstock, Van Duzee, and Wright.

Paper by Mr. E. P. Van Duzee, Entomology at the California Academy of Sciences.

Discussion by Comstock, Wright, and Van Duzee.

Paper by Mr. F. R. Cole, Curious Diptera from the Philippines and adjacent Regions. Illustrated with drawings and specimens.

Notes by Mr. Trevor Kincaid, The Alder Sawfly. The European Earwig.

Paper by Mr. J. A. Comstock, The Rediscovery of a Lost Species.

Discussion by Wright, Comstock, and Van Duzee.

After informal discussion, the meeting adjourned.

H. E. BURKE, Secretary *pro tempore*.

NOTE—Members attended the banquet with the American Association of Economic Entomologists at the University Club on Wednesday night, September 19, and had a very enjoyable time.

The ninety-second meeting of the Society was held in the Entomological rooms of Stanford University, on Saturday afternoon of November 8, 1923.

In the absence of the president and vice-president, the secretary called the meeting to order and asked for nominations for a president *pro tempore*. After due form, Professor Doane was elected to preside over the meeting.

Minutes of the preceding meeting were read and approved.

The following ten members were present: R. W. Doane, Charles L. Fox, Isabel McCracken, G. R. Ferris, E. P. Van Duzee, Miss Helen Sanford, Mrs. E. P. Van Duzee, F. E. Blaisdell Sr., Mrs. F. E. Blaisdell, and J. C. Chamberlin.

After the reading of the treasurer's report, there being no other business, Professor Doane gave the following account of his trip abroad:

"I spent about five months in Europe visiting various educational institutions and museums and conferring with as many entomologists as I could find at their offices or homes.

"First I visited Professor Newstead's laboratory at the Liverpool University and School of Tropical Medicine. I did not find Professor Newstead, but his two assistants, Miss Evans and Mr. W. H. Potts, kindly showed me over the laboratory, and I had an opportunity to see Newstead's wonderful collection of tsetse flies and to examine some of his splendid drawings. I also met here Dr. Stephens, noted for his work on malaria, and Dr. Herdman, the oceanographist. I next visited the Edinburgh University and Medical School, but did not find Professor Ashworth, who has charge of the zoological work there. I spent considerable time in the British Museum of Natural History. There I conferred with Major Austin, who is working particularly on the tsetse flies, and Mr. Laing, who has charge of the economic collections, Dr. Blair, the coleopterist, and Mr. Hirst, who is working on the mites, particularly the fossil mites. I had a wonderful time looking over some of the wonderful collections here in this museum.

"I also visited Professor Lefroy, who is entomologist for the Imperial College of Science and Technology. Lefroy is doing considerable work on insecticides, trying to find some efficient substitute for arsenic. He has recently published a new work on economic entomology. During Dr. Marshall's absence from the Imperial Bureau of Entomology, Dr. S. A. Neave is taking charge of his work, editing the Bulletin of Entomological Research and at the same time carrying on his own work as editor of the Review of Applied Entomology. This Bureau and the London Entomological Society are now comfortably housed in their new quarters.

"I had an interesting visit with Dr. Green at his home in Camberly, and was particularly interested in noting the very careful way in which he kept the records of all his magnificent collec-

tions. I did not find Dr. Nuttall in his laboratory at Cambridge, but Dr. Keilin made me most welcome and showed me over their fine new laboratory. At Harpenden I visited J. C. F. Fryer, entomologist to the minister of agriculture and director of their Central Station where they study some of the fundamental problems connected with agriculture. This station is also in charge of the quarantine work for England. The Rothamstead Experiment Station is also located at Harpenden. Here they have a group of fine new buildings and an excellent corps of workers. I was particularly impressed with the co-ordination of the work of different departments. Their watchword here seems to be 'prevention' when possible, rather than 'cure.' Dr. A. D. Imms is studying particularly the chemotropic responses of insects. Dr. J. Davidson is working on the biology of Aphids. Others in the laboratory are working on parasites of various insects of economic importance. At Eversham I visited some of the orchards to see their methods of combating the insects that attack their fruits.

"At the Institute Agronomie in Paris I found Dr. Paul Marchal, who is in charge of the Central Experiment Station there. Dr. Marchal is now especially interested in the biology of the woolly aphis, but is also still doing some work on the Coccidæ. The Colorado potato beetle has recently appeared in France, and the stations in the provinces where it has become established are doing all they can to prevent its spread. Dr. M. P. Vayssiere is at work on a monograph of the Monophlebiinæ. At the Jardin de Plants I looked over the collection of Diptera in Bouvier's laboratory, and also the collection of insects in the main museum building. At Lyons I had an interesting visit with Dr. A. Paillot, our chief authority on bacterial and fungus diseases of insects. Dr. Paillot is now interested particularly in parasites of certain economic insects.

"In Switzerland I visited the Natural History Museum at Geneva and met Dr. I. Carl, who is in charge of the invertebrate collections there. Here I had an opportunity of seeing Melly's wonderful collection of Coleoptera, Saussure's wasp collection and Forel's ant collection. They are doing very little work in economic entomology in Switzerland, but the two experiment stations, one at Lausanne and the other at Zurich, do some work on the pests of the grape-vines.

"In Florence, Italy, I visited the Statzione di Entomologia di Firenze. Unfortunately, I did not get to see Dr. Berlesi, director of this station, but had an opportunity to learn something of the work that they are doing and to see something of Dr. Berlesi's wonderful collection of mites. As in all the other European stations visited, the workers here are particularly interested in parasites. I had an interesting visit with Dr. Silvestri, in Portici. Dr. Silvestri is at present devoting a good deal of time to the study of the parasites of the olive fly which is threatening the

destruction of the olive industry in that part of Italy. He has a splendid collection of economic insects, a very interesting part of which is made up of the parasites which attack the pests in their various stages of development. Dr. Silvestri asked to be remembered to all of the entomologists he had met on his visit here to this coast."

In reply to inquiries, Dr. Blaisdell stated that Dr. Van Dyke expected to sail from Shanghai for home on December 8, and would arrive early in January.

At this point, Mr. B. C. Cain was proposed for membership in the Society. The proposal being duly seconded, the election took the usual course, resulting in the unanimous election of Mr. Cain.

After considerable discourse and viewing of the collections, the meeting adjourned.

F. E. Blaisdell, Secretary.

The ninety-third meeting of the Society was held on Saturday afternoon of March 1, 1924, in the Entomological rooms of the University of California, Berkeley, California.

President Van Dyke in the chair.

Reading of the minutes of the preceding meeting and treasurer's report were dispensed with.

Twenty-three members were in attendance as follows: E. C. Van Dyke, F. E. Blaisdell, Sr., E. R. Leach, Isabel McCracken, J. O. Martin, J. C. Huguenin, R. F. Sternitzky, Carl D. Duncan, J. C. Chamberlin, H. E. Burke, William F. Breeze, Charles L. Fox, G. F. Ferris, G. V. Wallace, W. B. Herms, Mrs. F. E. Blaisdell, Helen N. Sanford, B. C. Cain, R. W. Doane, O. E. Essig, J. F. Killeen, Louise V. Killeen, and E. P. Van Duzee.

The following eight visitors were present: N. Fiat, H. D. Jaynes, Theodore R. Gardner, Curtis P. Clausen, David Shepherd, J. F. Lamiman, Mrs. G. V. Wallace, and Mrs. E. Daniells.

There being no reports of committees or other important business, the subject of starting an entomological periodical was then taken up. After discussion, it was decided that such a journal should be started at once, and that a committee of five be appointed to act with the president and secretary as *ex-officio* members, and that they report on the ways and means adopted for its publication at the August meeting of the Society.

The following committee was appointed: G. F. Ferris, J. C. Chamberlin, O. E. Essig, Grant V. Wallace, and E. P. Van Duzee.

The subject of Field Day was next taken up and a committee was named to select a suitable locality. Committee: Chairman, Charles L. Fox; J. F. Killeen, and E. P. Van Duzee.

There being no further business before the meeting, the scientific part of the program was proceeded with. Mr. Curtis P. Clausen of the Bureau of Entomology at Washington was called upon to tell of his experiences in the Orient, studying means of control of the Japanese beetle (*Popillia japonica* New.). He stated that about ten to fourteen years ago the beetle was introduced into the United States, and has increased very rapidly. After considerable work the larvæ were found, and it was determined that it was parasitized by a tachinid fly. He stated that somewhere near 400,000 parasites had been sent to the United States. There are also both hymenopterous and dipterous parasites. Mr. Clausen then spoke of the entomologists of Japan.

Dr. Van Dyke discussed the subject.

Professor Essig was next asked to report any new facts appertaining to economic entomology. He stated that one of the greatest calamities in economics was the invention of the spray gun. Application of dusts was referred to and might prove to be a similar calamity. The possibility of fumes and gases being effective was considered.

Professor Herms told of his prospective trip to the Fanning

Island, one of the South Sea group, a biological survey of the island being a necessary preliminary to the study of the pests of the cocoanut trees and crops. The physical characterization was that of an Atoll and that it had a lagune. Said that he intended to take a graduate student with him. The actual work would require two months, besides a month going and one coming back.

After considerable social discussion, the meeting adjourned.

F. E. BLAISDELL, Secretary.

The ninety-fourth meeting of the Society was held on June 25, 1924, at 10:30 a. m., in Room 430, Zoology-Entomology building, Stanford University, in participation with the Affiliated Societies of the Pacific Division of the American Association for the Advancement of Science.

President Van Dyke in the chair. The meeting being called to order, the program, a symposium on "The Entomological Activities on the Pacific Coast, was begun.

The following twenty-eight members signed the roll: H. E. Burke, A. O. Larson, E. H. Nast, Roy E. Campbell, Carl D. Duncan, W. M. Giffard, L. O. Howard, Vasco M. Tanner, F. E. Blaisdell Sr., Mrs. F. E. Blaisdell, J. F. Killeen, E. P. Van Duzee, Mrs. E. P. Van Duzee, O. E. Essig, G. F. Ferris, Isabel McCracken, Lawrence Bruner, R. K. Vickery, R. W. Doane, J. C. Huguenin, J. C. Chamberlin, F. W. Nunenmacher, R. D. Hartman, E. C. Van Dyke, Harry Smith, J. O. Martin, J. B. Gladstone, Floyd H. Wymore.

Twelve visitors were in attendance: James C. Bryant, D. S. Currier, Leroy Childs, B. F. Amard, James McMurphy, Deogracias Villadolid, Josephine Nunenmacher, John M. Miller, T. D. A. Cockerell, Charles T. Vorhies, L. P. Rockwood, A. F. Burgess.

President Van Dyke, after a few appropriate remarks, began the program in the following order:

1. Dr. E. C. Van Dyke.
   Early Entomologists on the Pacific Coast.
2. Prof. R. W. Doane.
   Economic Entomology on the Pacific Coast.
3. E. P. Van Duzee.
   Present Day Systematists on the Pacific Coast.
4. Prof. O. E. Essig.
   The New Journal—the Pan-Pacific Entomologist.
5. Professor G. F. Ferris.
   Future of Entomology on the Pacific Coast.

The meeting then adjourned until 4 o'clock p. m., when the program was continued as short talks by visiting entomologists and notes and observations by members.

6. F. W. Nunenmacher.
   Remarks on the Species of *Omus:* Distribution and Habits, With Exhibits.
7. Dr. L. O. Howard.
   Remarks and greetings of the Entomological Society of Washington.
8. Prof. Lawrence Bruner.
   Remarks. Entomology past and present.

9. Prof. T. D. A. Cockerell.
   Remarks relating to the value and needs of entomological knowledge.

10. Harry Smith.
    Remarks of economic nature. The production of beneficial insects.

11. Dr. E. C. Van Dyke.
    The introduction of *Carabus nemoralis* in Golden Gate Park, San Francisco.

12. Dr. A. F. Burgess.
    Remarks concerning the Work of Controlling the Gipsy Moth. The work of *Calosoma syncophanta.*

13. F. W. Nunenmacher.
    Regarding the food of the Cychrini.
    Discussed by Dr. Van Dyke.

14. Prof. R. W. Doane.
    The need of works on California insects and the possibility of a publication of a work on the insects of California, similar to that of the insects of Connecticut.

15. Dr. J. F. Killeen.
    Getting young persons interested in Natural History.

16. W. M. Giffard.
    The greetings of the officers and members of the Hawaiian Entomological Society, stating that the Hawaiian Society is now in its twenty-first year and has published its annual proceedings, including descriptions of species ever since its organization in 1903.

The meeting then adjourned for social discussion.

F. E. Blaisdell, Secretary.